भारतीय मानक
Indian Standard

IS 17156 (Part 1) : 2019

कपास बीनने की मशीन

भाग 1 शब्दावली

Cotton Picker Machine

Part 1 Terminology

ICS 65.060.50, 65.060.99

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August 2019 **Price Group 5**

Agricultural Machinery and Equipment Sectional Committee, FAD 11

FOREWORD

This Indian Standard (Part 1) was adopted by the Bureau of Indian Standards after the draft finalized by the Agricultural Machinery and Equipment Sectional Committee had been approved by the Food and Agriculture Division Council.

Picking is the operation of collecting cotton bolls from plant with the help of spindles.

Cotton picker, commonly known as picker, is a machine designed for picking of the cotton from the field while moving through the standing crop. It may be of self-propelled type or tractor - operated (trailed) type.

In the preparation of this standard, considerable assistance has been received from Central Institute for Research on Cotton Technology (CIRCOT), Mumbai.

This Indian Standard is published in two parts. The other part in this series is:

Part 2	Performance tests

The composition of the Committee, responsible for the formulation of this standard is given at Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding-off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

COTTON PICKER MACHINE

PART 1 TERMINOLOGY

1 SCOPE

This standard (Part 1) covers the definitions for various terms most commonly used in relation to cotton picker machine (picker).

2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards:

IS No	*Title*
10000 (Part 4) : 1980	Method of tests for internal combustion engines: Part 4 Glossary of terms relating To Test Methods
IS 17156 (Part 2) : 2019	Cotton picker machine: Part 2 Performance test

3 GENERAL

For the purpose of this standard, the terms have been classified in two groups, namely:

a) Picker and its components, and
b) Picker operation and performance.

4 PICKER AND ITS COMPONENTS

4.1 Picking Unit

This is the main component of the picker which picks the seed cotton from the plants. Picking unit comprise following components (*see* Fig. 4.1) .

4.1.1 *Spindles*

These are conical shaped bars which picks the seed cotton from the plant with the help of barb available on them (*see* Fig. 4.1A)

4.1.2 *Grid Bars*

These are horizontally located bars meant to restrict the other materials entering in; it acts as a protective zone for drum (*see* Fig. 4.1.1)

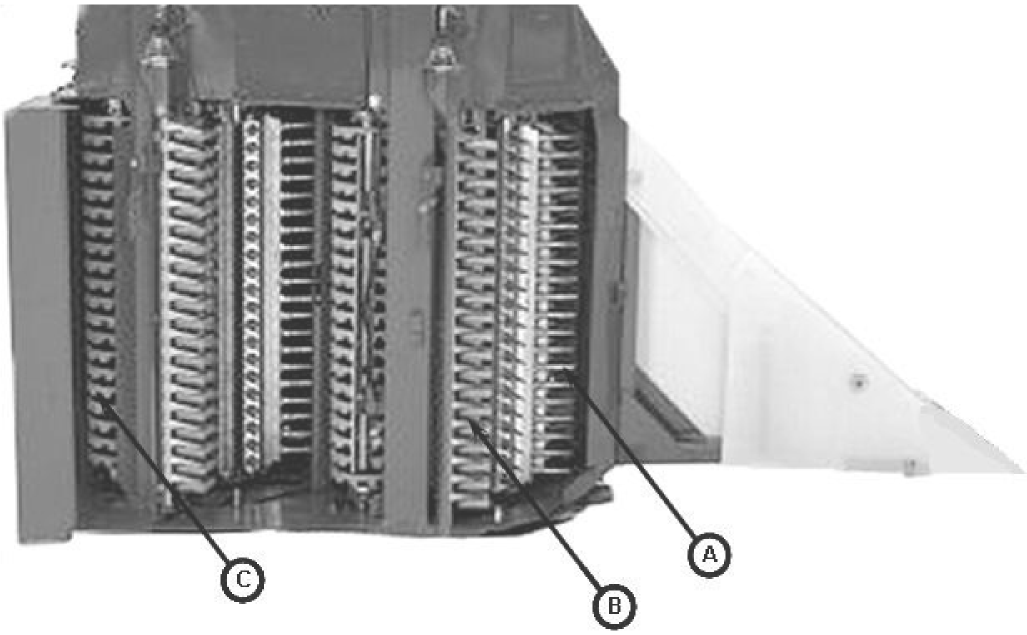


FIG. 4.1

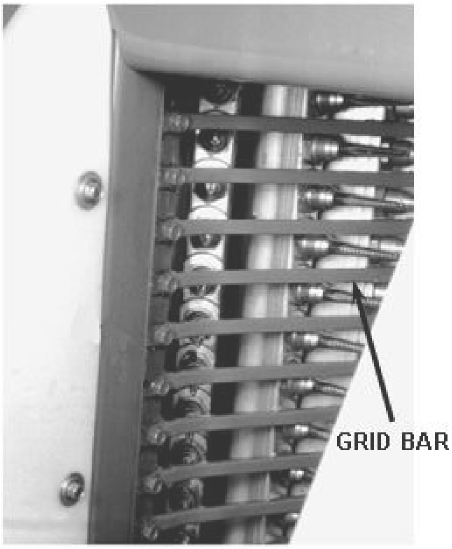
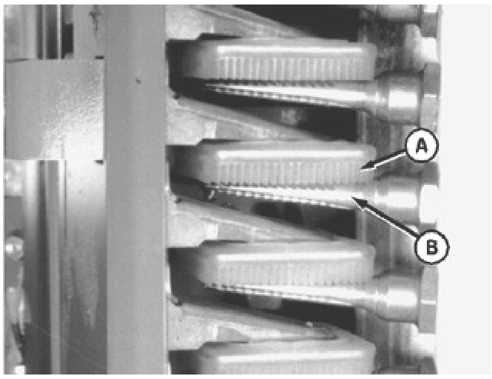


Fig. 4.1.1



A—Moistener Pad B—Spindles

4.1.3 *Pressure Plate*

These are the plates which are used to increase or decrease the gap between itself and spindle.

4.1.4 *Moistening Unit*

Moistening unit consists of moistener column, pad and tubes, used to moisten and clean the spindles with solution (*see* Fig. 4.1B)

4.1.5 *Doffers and Doffer Column*

Doffers are the components which unwind the cotton from spindles and dump them into the channel meant for cotton flow (*see* Fig. 4.1C)

4.2 Air Ducts

Air ducts are meant to convey the cotton from picking unit into the basket (*see* Fig. 4.2A)

4.3 Blower

A rotary device which produces a suction at the rear of the unit and an air stream further up the air duct that is utilized to convey the cotton from the picking unit (*see* Fig. 4.2B)

4.4 Seed Cotton Container

Seed cotton container is one of the major components of cotton picker which holds the cotton picked by picking units and dumps the same into the trolley (*see* Fig. 4.2C)

4.5 Cotton Picker

A machine designed for picking of the cotton from the field while moving through the standing crop. It may be of self-propelled type or tractor operated (trailed) type.

4.5.1 *Self-Propelled Picker*

A picker with an engine of suitable power rating is mounted to serve as a source of power.

4.5.2 *Tractor-Operated Picker*

A picker which requires a tractor of suitable power rating to serve as a source of power for its working, it may be trailed type or mounted type (*see* Fig. 4.2) .

4.6 Specifications

4.6.1 *Picker Height*

The vertical distance from the horizontal plane on which the picker (*see* Fig. 4.6.1, dimension A) is standing to the highest point on the picker expressed in millimeter.

4.6.1.1 *Dumping height*

It is the vertical distance from the ground to the tip of opening of the basket in its dumping position (*see* Fig. 4.6.3, dimension J).

NOTES:

1 Tyre and wheel shall be stated and tyre shall be inflated to the field operating pressure recommended by the manufacturer.

2 The plane on which the picker is standing shall be substantially level.

3 The basket shall be effectively empty and the fuel, radiator, hydraulic and lubrication tank shall be full.

4 The height with all components in position for transport and with all components in position for field operation shall be specified.

5 It shall be stated whether the picker with cab is fitted.

6 The maximum and minimum dimensions shall be the highest point and the lowest point to which the basket can be raised or lowered measured from the ground plane to the tip of the basket (*see* Fig. 4.6.1, dimension A and Fig. 4.6.3, dimension I).

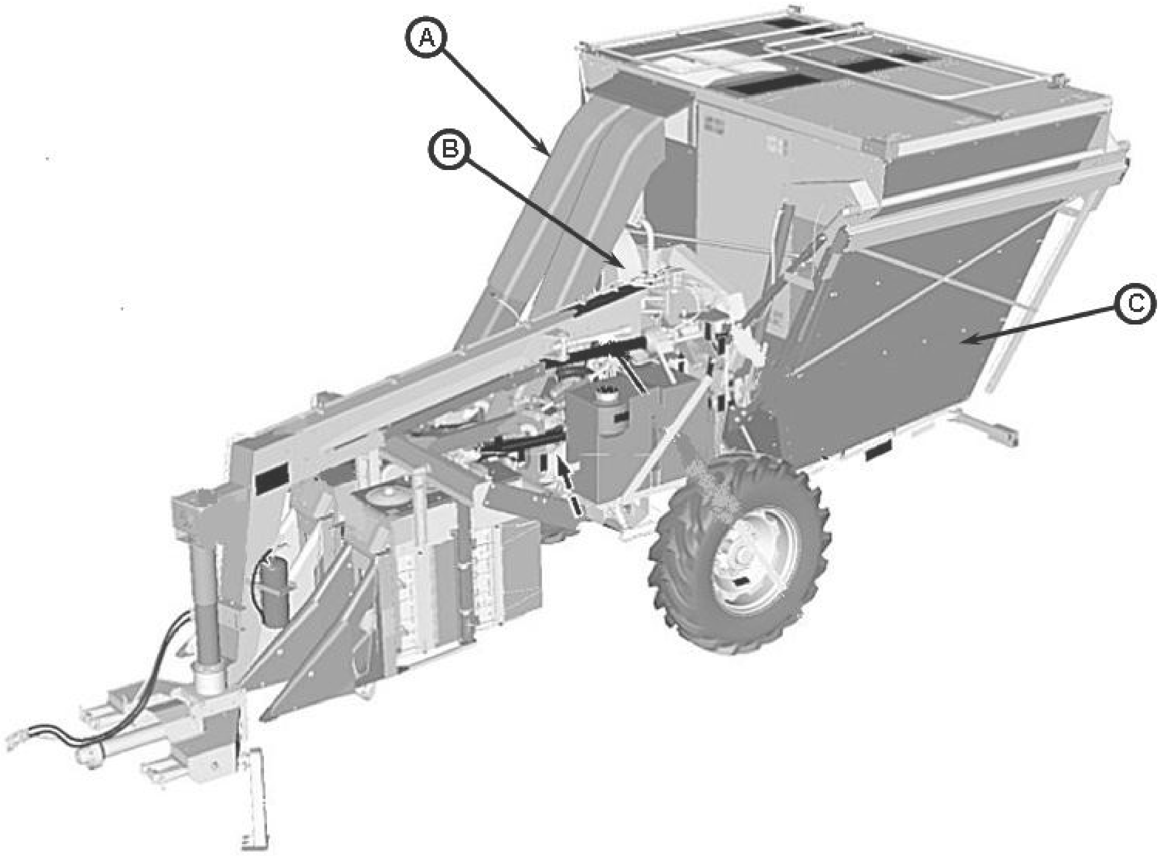


FIG. 4.2

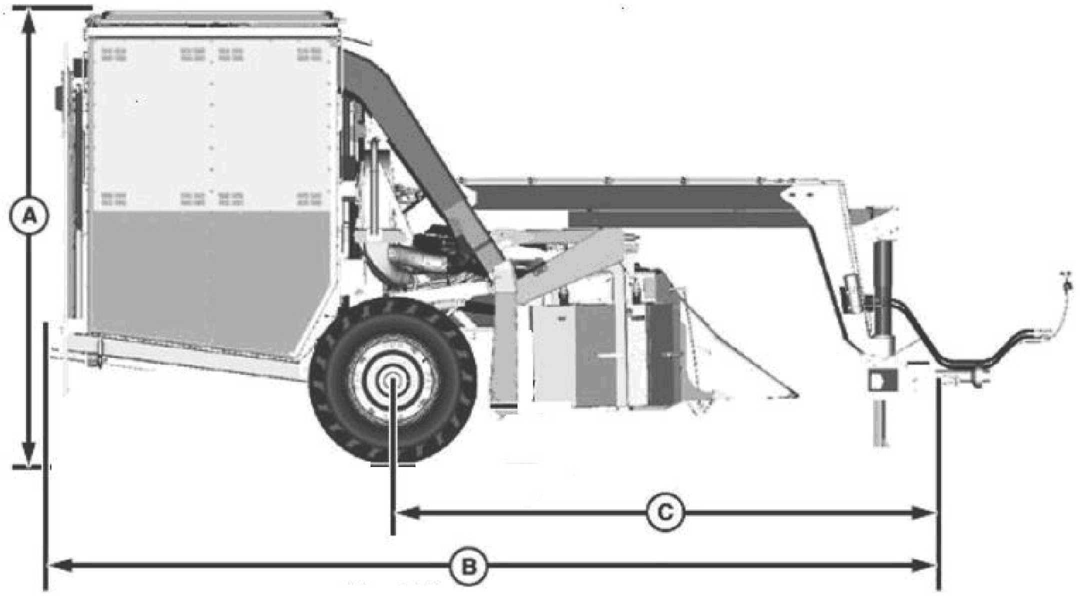


FIG. 4.6.1

4.6.2 *Picker Length*

The overall length, from the foremost point to the rearmost point of the picker (*see* Fig. 4.6.1, Dimension B) equipped for field operation, measured parallel to the longitudinal centre line of the picker expressed in millimeter.

NOTE — In case of tractor-operated pickers the tractor shall be excluded.

4.6.3 *Picker Width*

The overall width measured horizontally covering outer extremities of picker expressed in millimeter (*see* Fig. 4.6.2, Dimension F)

NOTE — The overall width shall be measured in both road travel condition and equipped for field operation. In the field condition based on the row spacing the overall width of the picker with respect to tiers might change.

4.6.4 *Picker Mass*

The mass of the complete picker equipped for field operation expressed in kilogram to the nearest 10 kg.

NOTES:

1 The mass shall be determined under the conditions specified in Notes 1 to 6 under **4.6.1.**

2 Any other attachments which affect the mass shall be specified.

4.7 Engine Horse Power

The corrected gross, rated, brake horse power measured as per IS 10000 (Part 4) : 1980.

4.8 Engine Displacement

Engine displacement shall be expressed in cubic centimeter.

4.9 Turning Radius

The distance from the turning centre to the centre of ground contact of the wheel describing the largest circle while the picker is taking its shortest turn for the respective steering brake condition expressed in millimeter.

NOTES:

1 It shall be measured on a clean, dry, level concrete or equivalent hard surface for both left-hand right-hand turning, with and without steering brakes in use.

2 The wheel base and guide wheel track width shall be stated.

3 The picker shall be operated at a speed not exceeding 2 km/h.

4.10 Turning Space

The diameter of the circle, described by the outermost point of the picker when it takes shortest turn, expressed in millimeter.

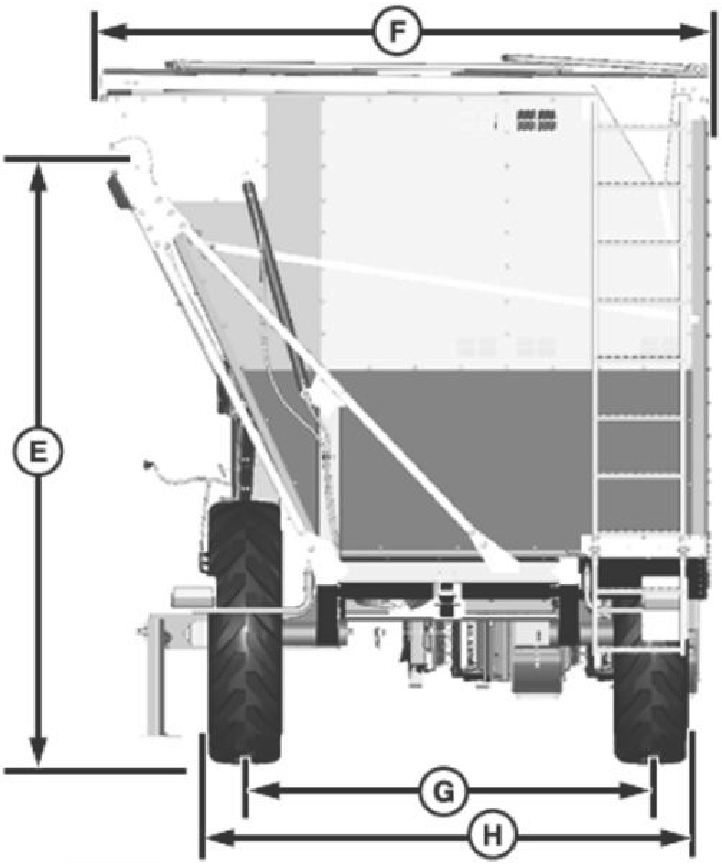


Fig. 4.6.2

NOTES:

1 Any other attachments affecting these dimensions shall be specified.

2 The wheel base and guide wheel tread width shall be stated.

3 The picker shall be operated at a speed not exceeding 2 km/h.

4.11 Ground Clearance

The height of the lowest point of the picker (excluding picking unit) from a level supporting surface when the picker is fitted with all its usual accessories, fuel, radiator, hydraulic, lubrication and basket full and the tyres inflated to recommended pressure for field work and expressed in millimeter.

4.12 Wheel Base

The horizontal distance between front and rear wheels on a picker measured at the centre or ground contact.

4.13 Wheel Track

The distance between the median planes of wheels on the same axle measured at the point of ground contact (*see* Fig. 4.6.2, dimension G).

5 PICKER OPERATIONS AND PERFORMANCE

5.1 Operations

5.1.1 *Picking*

The operation of collecting cotton bolls from plant with the help of spindles.

5.1.2 *Doffing*

The operation of unwinding the cotton from the spindle.

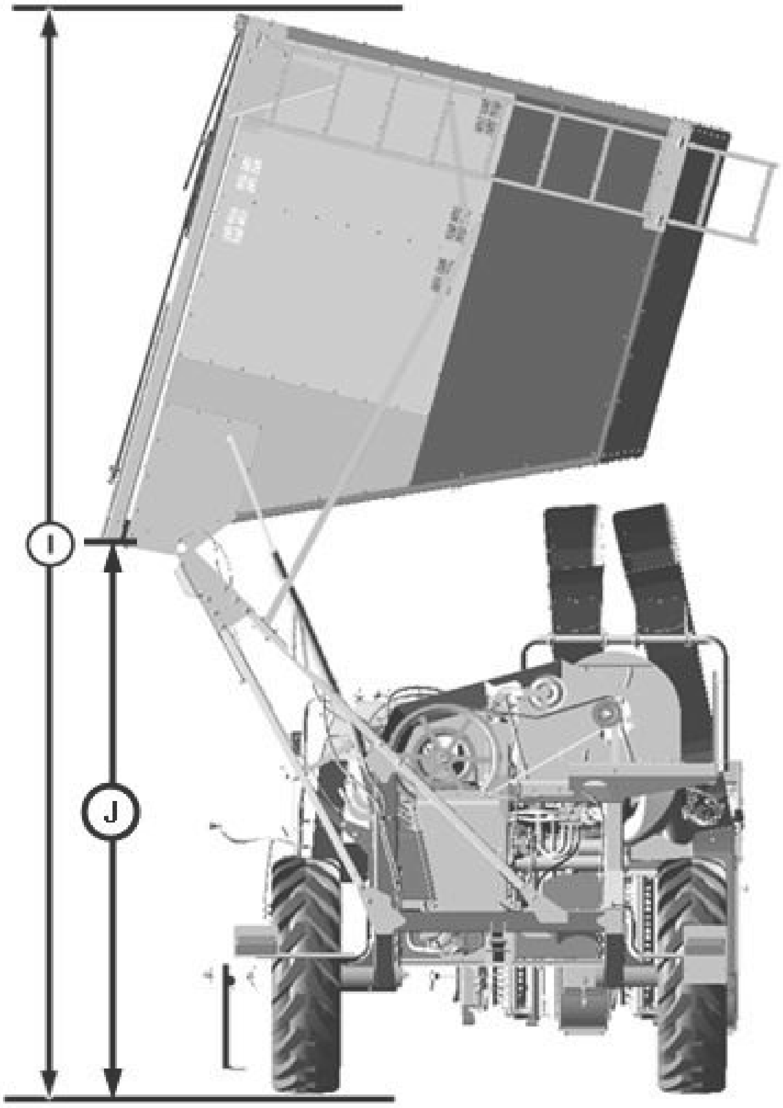


FIG. 4.6.3

5.1.3 *Transferring*

The operation in which the cotton is sent into the basket through air ducts.

5.1.4 *Moistening and Flushing*

The operation in which the spindles are kept in moist condition by dripping solution continuously is moistening. Whereas, allowing lot of solution to clean the spindles is known as flushing .

5.1.5 *Dumping*

The operation in which the basket is tilted so that the cotton collected can be taken out in suitable trolley .

5.1.6 *Unit Raising and Lowering*

The operation in which the picking unit is raised or lowered manually with the help of hydraulic power.

5.1.7 *Tethering*

The operation in which inspection bypass system allows the operator to manually activate and control slow forward rotation of the spindles from the ground during inspection and maintenance.

5.2 Performance

5.2.1 *Capacities*

5.2.1.1 *Seed cotton output capacity*

It is the mass of the seed cotton delivered by the picker per unit time. It shall be expressed in metric tons per hour or kilograms per hour.

5.2.1.2 *Seed cotton container capacity*

It is the capacity of the container to hold the seed cotton expressed in cubic meter or metric tone.

5.2.2 *Seed Cotton Unloading Time*

It is the minimum time in seconds, required to unload the seed cotton.

5.2.3 *Cotton Terminology*

5.2.3.1 *Cotton*

Cotton is a soft, staple fibre that can be spun and woven into a textile.

5.2.3.2 *Cotton bolls*

The white “fruit” of the cotton plant which is harvested from cotton.

5.2.3.3 *Seed cotton*

This is also called as raw cotton, includes both cotton seed and cotton fibre.

5.2.3.4 *Lint*

Cotton fibres separated from seed cottons.

5.2.3.5 *Moisture content*

Moisture content of the seed cotton shall be expressed in percentage on the dry basis.

5.2.3.6 *Defoliation*

Process of shedding the leaves with the help of chemicals prior to picking this makes it easier for mechanical picking and diminishes boll staining.

5.2.3.7 *Mature bolls*

A mature boll is one that has sufficient nutrition to open normally if the subtending leaf is removed. The bolls are with hard cotton seed and are usually big.

5.2.3.8 *Immature bolls*

The bolls are with soft cotton seed and are usually small.

5.2.3.9 *Trash*

The impurity available with the seed cotton, mainly due to availability of leaves, stems, clay, mud etc.

5.2.3.10 *Plant length*

The average length of the plant from its base at ground level to its top when the plant is straightened, expressed in millimeter.

5.2.3.11 *Plant width*

The average width of the plant from its extreme branch tip measured horizontally when the plant is straightened, expressed in millimeter.

5.2.3.12 *Plot*

It is the portion of the field which has the representative crop conditions without ditches, trees, poor stand, uneven crop, or other extenuating factors which would cause inaccurate results.

5.2.3.13 *No. of bolls per plot*

It is the number of the bolls available with each plot.

5.2.3.14 *Average seeds per boll*

It is the average number of seeds available with each boll.

5.2.3.15 *No. of seeds per plot*

It is the product of number of bolls per plot and the average seeds per boll.

5.2.4 *Ground Loss*

It is the ratio of count of seeds fallen on the ground to the number of seeds per plot after picking operation .

5.2.5 *Plant Loss*

It is the ratio of count of seeds on the plant to the number of seeds per plot after picking operation.

5.2.6 *Total Loss*

It is the sum of the ground loss and the plant loss.

5.2.7 *Picking Efficiency*

It's expressed as percent of cotton picked (100 percent – Percent total loss = Percent efficiency)

NOTES*:*

1 Look the field over carefully and select the plot as per **5.2.3.12**.

2 Identify the starting point of the test plot. Be sure to locate the start of the test plot far enough away from cross-dikes to ensure that the machine is well beyond the effect of tyres crossing the dike.

3 Use some judgment as to whether a seed is a true mature seed or an immature seed that should not be counted (*see* **5.2.3.7** and **5.2.3.8**).

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Agricultural Machinery and Equipment Sectional Committee, FAD 11

Organization	*Representative(s)*
Central Institute of Agricultural Engineering, Bhopal	Dr K. K. Singh (***Chairman***)
Agriculture Machinery Manufacturer's Association (AMMA), Pune	Shri Balachandra Babu Dr Surendra Singh (*Alternate*)
Central Farm Machinery Training and Testing Institute, Budni	Shri J. J. R. Narware Shri C. V. Chimote (*Alternate*)
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Ministry of Agriculture, New Delhi	Shri V. N. Kale SHRI A N Meshram (*Alternate*)
North Eastern Region Farm Machinery Training & Testing Institute Assam	Shri K. K. Nagle Shri S. G. Pawan (*Alternate*)
Northern Region Farm Machinery Training and Testing Institute, Hisar	Shri P. K. Pandey
Project Coordinator, AICRP on Farm Implements and machinery, CIAE, Bhopal	Dr C. R. Mehta
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Member Secretary

Shri Pawan Kumar
Scientist ‘B’, BIS

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